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Differential Effect of Advertising Frequency on Sales Turnover and Ads to Sales Ratio

Keywords: accounting ratio, Ads to Sales Ratio, sales turnover, advertising and finance, repeated Ads.

J E L Classification: D25, M4, M41, M3, M37.

Abstract: This paper analysed the differential impact of repeated advertising on sales turnover and the attendant effect on accounting Ads to Sales Ratio. The paper adopts a quantitative approach and collects marketing and promoting expenditure data (as proxy for Ads activity) from Amazon Company for twenty years (2003 – 2022). The data was analysed by using the t-test of mean difference statistics and a simple regression. The t-test analysis showed that the Ads to Sales Ratio had a significant increase between two periods of comparison (2003-2012 and 2013-2022); in the same vein, there was a significant increase in mean net sales value by up to nine hundred percent – an increase which dwarfs the hundred percent increases in the Ads to Sales Ratio over the period. Furthermore, a simple regression analysis shows that marketing expenditures (used as proxy for Ads activity) produced a highly significant positive effect on net sales at a P-value of less than P<0.00001. This finding shows that current literature suggestion that increased Ads may wane consumer brand patronage may not be applicable to all industries, rather, this paper's result indicates that for companies such as Amazon, increased Ads, or marketing and promotion activities may produce high net sales in some companies such as Amazon. The paper contributes by developing a process framework for repeated advertisement, Ads to Sales Ratio and net sales. It recom-

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mends further application of the proposed framework in related companies by future researchers.

Introduction

The cost of advertising remains a contentious issue amongst chartered accountants and/or chief financial officers; this is because whether it is capitalised or recognised and written off against revenue as it is incurred, the cost of advertising remains an important accounting costs given the intangible but important impact on both current and future profits of a company including the quagmire about the tax benefit recognition (Maples & Earles, 1999). Hence, the accounting intricacy associated with advertisement expenses makes it imperative to consider whether repetitive advertisement really attracts benefits or loss for the company (Verma, 2009).

Advertising expenses features prominently as a vital element of operating expenses in the accountant's financial accounts and in some management accounting analysis (Mun & Jan, 2018; Enache & Srivastava, 2018; Matsuoka, 2020). However, accounting research seldom dwells on advertising expenses and the attendant ramifications on sales revenue. However, there is a gradual shift in moder accounting research where some scholars have begun to consider advertising expenditure and/or investment phenomena as imperative toward bolstering the strategic decision-making of chief financial officers, marketing managers, production mangers and other managers in the corporation. Perhaps the importance of advertising expenditures and their effectiveness have become more profound in contemporary fourth industrial revolution, where information technology with attendant artificial intelligence and digital marketing has brought unprecedent disruptions and/or innovations in product advertising investments and their various modes of communication (Matsuoka, 2020). One of the extant research that looked at advertising expenditures effect include the paper in the Copernican Journal of Finance and Accounting, which focussed on the effect of intangible corporate factors on profitability – where intangible includes advertising expenses (Kaymaz, Yilmaz & Kaymaz, 2019).

The importance of advertising in accounting decision making and hence the significance of this paper is highlighted in a Harvard Business Review paper, which highlighted the shortsighted view of advertising expenditure by management where emphasis seem to focus more on the impact on short-term profit and loss accounts. Rather it is advised that management's view of advertising expenditure should be more of as capital investment whose financial benefits in form of sales revenue would be generated over time in a stream of flows (Dhalla, 1978).

Whilst some business executives might seem bewildered by disruptions caused by the digital world regarding product communications and the expenditures thereof, the industrial and commercial ecosystem under the current digital world also requires expenditure and/or investment adaptation regarding product promotions albeit emerging new forms of product promotion metamorphosis catalysed by bourgeoning technology. No business can afford to lag as this would mean loss of dire market niche and revenue. Hence, the question by modern corporate executives is whether advertising expenditure or investment still pays off in terms of returning commensurate sales turnover. Answering this question is of vital value to managers as they grapple with growing stiff competition in the fluctuating market environment.

Although there is myriad of impacts which advertising investment might have on overall corporate financial performance, the objective of this paper is to evaluate the differential effect of advertising frequency on sales turnover. The objective is driven by a problem, which emanates from a very recent empirical study, which reveals that repeated advertising may lead to a loss of consumer patronage, hence loss of sales revenue (Tremor International, 2023). This paper thus attempts to evaluate further applicability of this finding on advertisement to sales ratio (Ads to Sales Ratio) to provide additional information on how adverts may impact on sales revenue and Ads to Sales Ratio using extended company data drawn from financial reports.

The paper contributes to extant research given its unique model which shifts slightly from the dominant models which have focussed more on advertising expenditure with little focus on advertising frequency and the effect on sales and extension to Ads to Sales Ratio. The paper thus provides practical industry value to Chief Financial Officers (CFOs) with important information towards advertising investment decisions to consider investment in advertising expenditure as an important driver of sales revenue flow – hence for companies such as the Amazon Company, a sustained investment in advertising, or marketing and promotion should be an important subset of corporate expenditures planning to reap the benefits on sales that should span over many years (Wang, Zhang & Ouyang, 2009; Dhalla, 1978).

Methodology and the research process

This paper applies a mix of literature review, quantitative analysis of data and framework (or model development) process (Figure 1). The method is in alignment with the paper's objective, which is to analyse the effect of repeated advertisement (advert activity) on sales revenue and on Ads to Sales Ratio. The paper used a close proxy for advertisement activity, which is marketing and promotion expenditure to represent repeated Ads activity. Hence, the paper used real-life company data on marketing and promotion expenses and net sales revenue from the Amazon Company financial statements for twenty years (2003 – 2022) (Amazon, 2024). The data were analysed using the t-test of difference in means and the simple regression. The analysis follows recent literature findings, which revealed a sixteen percent (16%) reduction in consumers purchase intention of brands after being expose to repeated advertisement of the brand (Tremor International, 2023). Accordingly, the paper used the marketing expense data (proxy for Ads activity) and net sales revenue for twenty years from Amazon to evaluate how marketing and promotion expenses from the Amazon has affected sales revenue and Ads to Sales Ratio over the twenty-year period.

Literature review

In their view on the importance of advertising, Dhalla (1978), stresses that it is important for both newly founded and existing firms to use advertising. For these companies, it becomes even more important because it is essential to building client loyalty and improving brand recognition. In essence, advertising fosters the development of goodwill, an intangible asset. Furthermore, Dhalla (1978) notes that antitrust economists, who generally dislike advertising, hold this same viewpoint whilst contending that the physical capital needed for infrastructure and equipment can be just as formidable an entry barrier as brand franchise, which is developed through significant investments in mass media (Dhalla, 1978). Although some research finds advertising expenditure to not necessarily catalyse revenue growth (Hossain & Islam, 2019), but others find product promotion as a catalyst that may spur revenue (Abdullahi 2015; Hossain & Islam, 2019). In their search for potential correlation, Abdullahi (2015) evaluated the impact of advertising on profitability and sales revenue. Using the OLS statistics, their first hypothesis test revealed that there isn't a statistically significant positive correlation between the companies' sales income and their advertising expenses. On the other hand, the results of the second hypothesis test showed a strong positive link between advertising and the companies' profitability. Thus, this study concluded that advertising is an important communication tool that affects business performance in a variety of ways.

In other related research, Hossain and Islam (2019) found a negative relationship between advertising and sales revenue, and a positive association between sales incentives, revenue and profit (Hossain & Islam, 2019). The impact of advertising costs on Taiwanese hotels' sales, profitability, risk, and returns is examined by (Chen, 2015). They also investigated whether the economic cycle affects how advertising costs impact hotel sales, profitability, risk, and returns. Their panel regression test's show that, in terms of occupancy rate and revenue per available room, the ratio of advertising costs to total assets significantly increases hotel sales revenue. This finding is close to the findings of Ji (2017), who found that advertising expenditure has a significant positive effect on sales. On the other hand, Chen (2015) results show that regarding return on equity and return on assets, advertising expenditure has no appreciable impact on hotel profitability. The inverted U-shaped link between advertising expenses and occupancy is curvilinear (Chen, 2015). Like the foregoing findings, another related study by Kaymaz et al. (2019) evaluated the impact of intangible factors such as sales expenses on profitability in Muscat Securities Market listed companies; they found a positive relationship between intangible factors (such as advertising expenses) and profitability. This finding corroborates the finding by Akan (2016) which found that investment in advertising assists to maximise discounted profits over a long-term period.

Following the uncertainties expressed in some empirical results, some researchers have rather considered the long-term effect of advertising expenditures, which highlights the need to look beyond the immediate short-term when investing on advertising (Wang et al., 2009; Leong, Ouliaris & Franke, 1996; Chemmanur & Yan, 2019; Kim, Jun & Tang, 2019).

Other researchers such as Wang et al. (2009) investigated how advertising affects a company's intangible assets by analysing the relationship between advertising and business value through the usage of consumer-based brand equity marketing research, which challenges the conventional assumption utilized in accounting and finance disciplines. Wang et al. (2009) used techniques and financial data to create new metrics to evaluate how well advertising creates intangible brand value. Their results support the idea that advertising expenses have qualities like those of an asset or investment by indicating that advertising has cumulative and sustainable effects on a company's intangible assets. Wang et al. (2009) study also shows how different companies are at building brand equity through advertising and offers an empirical approach for assessing long-term advertising performance. In their further analysis of the long term implication of advertising expenditure, Leong et al. (1996) highlights that when estimating the long-term effects of one variable on another, co-integration econometrics provide a number of theoretical advantages over standard methods. They opine that rather than relying on conclusions from short-term relationships, it is possible to directly evaluate the long-term effects by establishing possible co-integration between advertising and sales data. Hence, Leong et al. (1996) presents a method for identifying and estimating co-integrating relationships using conventional least-squares regression algorithms. Their application and analysis of the Lydia Pinkham data, which spans 1907 to 1961, reveals a strong, positive correlation between sales and Lydia Pinkham's advertising over the long run.

Another related study on the short and long-term effects of advertising on stock returns was carried out by (Chemmanur & Yan, 2019). Even after adjusting for other price predictors like size, book-to-market, and momentum, the analysis showed that a higher level of advertising is associated with a better stock return in the year of advertising but a lower stock return in the following year. The researchers postulated that throughout the advertising year, investors' attention is drawn to the company's stock, causing the stock price to rise. But eventually, the attention that it garners fades, and the stock price drops the next year. This theory was evaluated in the study, and consistent results showed that advertising raises a company's visibility among investors with the possibility of raising stock returns with more increases in advertising. Kim et al. (2019) looked at both quadratic and dynamic connections in their investigation of the relationship between restaurant performance and advertising. Using stock value, sales, and profitability as performance metrics, the researchers analyzed data from 137 public restaurant companies in the United States between 1991 and 2016 using three stage least squares estimate. Their findings showed that the impact of advertising varied according on the amount spent, with spending on advertising having a quadratic influence on all three variables. Furthermore, the research revealed noteworthy correlations among sales, profitability, and advertising expenditure, underscoring the fluidity of these variables in the restaurant sector. Restaurant managers are urged to consider their performance goals and the evolving efficacy of advertising in light of these findings. In a similar research pursuit, Lee, Kim and Rhee (2021) developed a model which they applied to evaluate the effect of marketing strategic decisions and financial performance. Using data from the Korean franchise chains, their results indicate that promotion and advertising expenses show a positive effect on financial performance – which thus suggest that advertising and promotion investment has the propensity to impact a balanced business profitability (Lee, Kim & Rhee, 2021). The improved performance effect of advertising is echoed by Mani, Thiyagarajan, Azhaguraja and Janakiraman (2022), who indicates particularly that modern medium of advertising may possess the propensity to increase companies return on investment. They highlight that social media advertising has particularly proven to improve companies' sales performance.

Furthermore, in response to the bourgeoning effect of artificial intelligence in business and other human endeavour, the effect of artificial intelligence (AI) has also been brought to the fore in contemporary accounting, finance, and business literature.

Accordingly, in their research on the role of AI on advertising, Qin and Jiang (2019) opine that traditional advertising approaches cannot keep up with the growing demand for advertising in the burgeoning e-commerce sector. Artificial Intelligence (AI) platforms and advertisers are using these technologies to increase efficiency and meet consumer demands. Qin and Jiang (2019) gathered insights into the use of AI technology in advertising through their five years of observations in the Chinese advertising sector. In their conclusion, Qin and Jiang (2019) propose that the four main elements of the AI-powered advertising process are: ad design, media planning and buying, ad impact evaluation, and consumer insight finding. This cutting-edge advertising strategy is tool-based, synchronized, and incredibly successful. It is supported by a data-driven platform with algorithms at its heart (Qin & Jiang, 2019). In relation to AI influence on customer behaviour and engagement, Du, Zhang and Ge (2023) opine that AI Generated Content Advertising exert significant positive influence on customer behavioural engagement with products.

Other researchers have thus tried to analyse if and how advertising affects customer decisions to buy service offerings (Ali, 2021). Accordingly, in their survey study of the effect of advertisement on students' choice of higher educational institute, Ali (2021) found that advertisements of academic offerings made in the social media and television had a significant impact on students' choice and on the number of student customers. Similarly, Verma (2009) conducted a study to investigate how contextual and repeating ads affect customer behaviour. A connection between contextual commercials and consumer purchase decisions as well as a link between repeating advertisements and consumer buying decisions were established by the study using a Chi-square test. Their findings of the Kendall tau-b test also showed a negative correlation between paying attention to commercials, being persuaded to buy, and continuing to support repeat and contextual marketing.

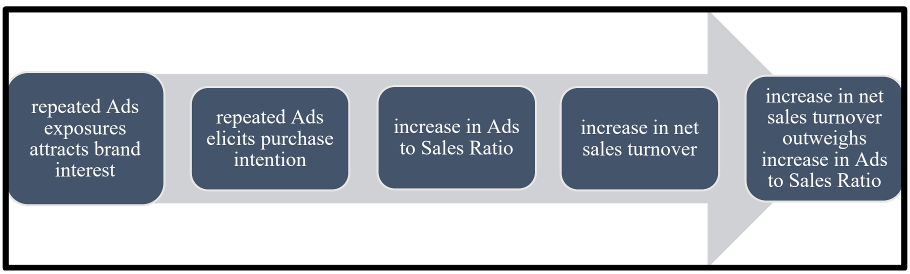
This current paper contributes to the existing literature by contributing a process framework of effect of repeated advertisement on accounting Ads to Sales Ratio and net sales. It examines the uncertain phenomenon of Ads versus sales turnover by expanding the dependent variable through the analysis of how Ads activity constitute a joint effect on sales turnover and Ads to Sales Ratio by using real company data from Amazon company spanning a period of twenty years.

Results and conclusions of the research process

A foundation for the paper's statistical analysis is based on the author's development of horizontal impact framework of repeated advertising, sales turnover, and Ads to Sales Ratio (in Figure 1). The implication of this paper's framework is fundamental for theory, academia and practice because whereas conventional literature holds that increase in Ads to Sales Ratio or increase in repeated Ads may connote weak returns of advertising, promotions and/or marketing expenditures to overall net sales revenue (Tremor International, 2023), this paper demonstrates that in some instances like in this case of Amazon, increase in their marketing and promotion expenditures led to increases in their Ads to Sales Ratio and also led to a significant increase in their net sales revenue continuously over the twenty years period examined in this paper (2003 – 2022). Importantly, the increase in their net sales outweighs the increase in their Ads to Sales Ratio. This performance thus shows that some industries such as Amazon in this study may experience more sales returns as they engage and invest more in their sales promotion and marketing expenses; the findings of this study demonstrates that increases in Ads or marketing and promotion activity can be a worthwhile investment for companies such as Amazon or the likes of

Amazon. Accordingly, since this paper used Amazon's data for analysis, further research may consider using other companies that are similar to the business of Amazon to evaluate the possibility of replicating the findings of this paper. Hence, this paper develops a framework (Figure 1), which is in alignment with the findings of the analysis results in Table 1 to Table 5.

Figure 1. A Process Framework of Effect of Repeated Advertisement on Accounting Ads to Sales Ratio and Net Sales



Source: author's framework.

To provide a quantified demonstration of the above framework, the author used marketing and promotions expenditure (as proxy for Ads activity) and net sales revenue from the Amazon company for twenty years covering 2003 to 2022. Accordingly, Table 1 presents the Net Sales and Marketing Expenses for The Amazon Company. The Amazon data in Table 1 is subsequently used to prepare the Ads to Sales Ratio in Table 2. Thereafter, Table 3, Table 4 and Table 5 presents the t-test of difference in net sales revenue between previous ten years of Amazon (2002 – 2012) and current ten years of Amazon (2013 – 2022) (see Table 3), t-test of difference in Ads to Sales Ratio between previous ten years of Amazon (2002 – 2012) and current ten years of Amazon (2013 – 2022) (see Table 4), and simple regression of the effect of marketing expenses on net sales revenue (Table 5).

The t-test statistics of difference in mean (Table 3) shows a significant mean difference in net sales revenue between previous ten years of Amazon (2002 – 2012) and current ten years of Amazon (2013 – 2022). The difference is in net sales highly significant at P=0.0003 (in one-tail test) and P=0.0003 (in two-tail test), which shows high net sales during periods of higher marketing expenditure. Similarly, (Table 4) shows a significant mean difference in Ads to sales ratio between previous ten years of Amazon (2002 – 2012) and current ten years of Amazon (2013 – 2022). The difference Ads to Sales Ratio is highly significant at P=0.0004 (in one-tail test) and P=0.0009 (in two-tail test). Contrary to some recent empirical research, which finds that repeated Ads may wane consumer brand patronage (Hossain & Islam, 2019; Tremor International, 2023), this current analysis shows that comparatively, the Ads to Sales Ratio increased by (100 percent) between previous ten years of Amazon (2002 – 2012) and current ten years of Amazon (2013 – 2022). In contrast, the net sales revenue increased by (over 900 percent) between previous ten years of Amazon (2002 – 2012) and current ten years of Amazon (2013 – 2022). This indicates that, for some companies such as the Amazon, increases in Ads (using marketing & promotions expenses as proxy) may provide a high booster to sales revenue. A further test, which uses the simple regression (Table 5), shows that marketing expense has a highly significant and positive effect on net sales revenue of Amazon Company. This is a further confirmation, that increase in Ads activity (using marketing expenses as proxy) has a high propensity of boosting net sales in a company like Amazon used in this paper. The practical and theoretical implications is that for companies such as Amazon, which uses much of online sales, increasing Ads or marketing promotions may catalyse a good return on investment. Theoretically, this finding indicates the need for researchers and academics delineate between companies with dominant online sales outlet and companies with dominant physical location sales outlet when studying the effect of Ads activity on sale revenue.

Table 1. Net Sales and Marketing Expenses (Amazon)

TEN YEARS 2013 - 2022		TEN YEARS 2003 - 2012	
MARKETING EXPENSES ($M)	2013-2022 NET SALES($M)	MARKETING EXPENSES ($M)	2003-2012 NET SALES ($M)
3045	74452	122	5263
4207	88988	158	6921
5062	107006	192	8490
7233	135987	259	10711
10069	177866	336	14835
13814	232887	469	19166

Table 1. Net Sales…

TEN YEARS 2013 - 2022		TEN YEARS 2003 - 2012	
MARKETING EXPENSES ($M)	2013-2022 NET SALES($M)	MARKETING EXPENSES ($M)	2003-2012 NET SALES ($M)
18878	280522	660	24509
22008	386064	2340	34204
32551	469822	1591	48077
42238	513983	1002	61093

Source: Amazon 2003 – 2022 Annual Reports (Amazon, 2024).

Table 2. Analysis Of Ads to Sales Ratio

2003-2012 ADS TO SALES RATIO	2013-2022 ADS TO SALES RATIO
0.023	0.041
0.023	0.047
0.023	0.047
0.024	0.053
0.023	0.057
0.024	0.059
0.027	0.067
0.068	0.057
0.033	0.069
0.016	0.082

Source: author's Analysis with data from Table 1 (Amazon, 2024).

Key to Table 2:

Ads to Sales Ratio (advertising to sales ratio): is calculated as follows (with data from Table 1):

$$\frac{\text{Advertising expenses}}{\text{Net Sales Turnover}}$$

Table 3. t-Test: Paired Two Sample for Means for Amazon's Net Sales Before and Following Increases in Marketing & Promotions

	013-022NET SALES	003-012NET SALES
Mean	246757.7	23326.9
Variance	25892555204	358081383.4
Observations	10	10
Hypothesized Mean Difference	0	
df	9	
t Stat	4.964577975	
P(T<=t) one-tail	0.000387821	
t Critical one-tail	1.833112933	
P(T<=t) two-tail	0.000775643	
t Critical two-tail	2.262157163	

S o u r c e : author's Model Analysis (Using Amazon's Marketing Expenses Data).

Table 4. t-Test: Paired Two Sample for Means for Amazon's Ads to Sales Ratio Before and Following Increases in Marketing & Promotions

	2013-222ADS TO SALES RATIO	2003-2012ADS TO SALES RATIO
Mean	0.058035945	0.028476082
Variance	0.000149768	0.000214134
Observations	10	10
Hypothesized Mean Difference	0	
df	9	
t Stat	4.817558665	
P(T<=t) one-tail	0.0004751	
t Critical one-tail	1.833112933	
P(T<=t) two-tail	0.0009502	
t Critical two-tail	2.262157163	

S o u r c e : author's Model Analysis (Using Amazon's Net Sales and Marketing Expenses Data).

Table 5. Simple Regression on the Effect of Amazon's Marketing Expense on Net Sales Over Twenty Years

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.984857
R Square	0.969944
Adjusted R Square	0.968274
Standard Error	28483.23
Observations	20

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	4.71E+11	4.71E+11	580.8728	0.000001
Residual	18	1.46E+10	8.11E+08		
Total	19	4.86E+11			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	25430.16	7826.162	3.249378	0.004452	8988.00389	41872.32	8988.0039	41872.31718
MARKETING	13.18769	0.547178	24.1013	0.000001	12.0381146	14.33727	12.038115	14.33726933

Source: author's Analysis (Using Amazon's Net Sales and Marketing Expenses Data).

Discussion and conclusion

Scholars have diverse opinions on the accounting benefit of advertising. Whilst some hold a positive viewpoint, others do not and this calls for care by accountants, CFOs, operations and marketing managers. As an instance, Verma (2009) opines that researchers have determined that advertising is one of the most potent and successful tools available for improving sales related performance. Sometimes, though, it could not be as effective as first thought. Despite this, the idea that advertising operates through powerful types of manipulation or persuasion is not well-supported by hard data. Because there are so many commercials in today's world, some consumers may likely be resistive and/or uninterested in many adverts. Consequently, marketers are coming up with fresh ideas to get people to interact with their advertisements such as the bourgeoning usage of artificial intelligence (AI).

Given the growing costs associated with corporate expenses and growing corporate financial failures, this paper proceeded to analyse the differential impact of repeated advertising (using marketing expenses as proxy for Ads activity) on sales turnover and the attendant effect on accounting Ads to Sales Ratio. Subsequently the author used marketing expense and net sales revenue data from the Amazon company covering a period of twenty years (2003 – 2022) to analyse the difference in net sales and Ads to Sales Ratio as a result of increases in marketing expenses (used as a proxy for activity).

Findings from the t-test analysis shows that the Ads to Sales Ratio increased by hundred percent. The net sales revenue increased by over nine hundred percent during the period of differential analysis. Thus, the increase in net sales significantly outweighs the increase in Ads to Sales Ratio over the period. Accordingly, this increase in net sales suggest that, for some companies similar to Amazon, increases in Ads (using marketing promotions expenses as proxy) may provide a significant booster to sales revenue. A further test with simple regression statistics indicates that Ads or marketing and promotions has a highly significant and positive effect on net sales revenue of the Amazon. These findings show that companies with high concentration on online sales may have a higher propensity of generating return on marketing and promotions as reflected through net sales increases in Amazon over the past twenty years. This paper opens an avenue for further research to apply this paper's framework for future analysis of this important corporate phenomenon. Such future research may consider expanding the sample size with more time series and additional companies in the data pool.

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